



How Bio-diverse Ecosystems Store More Soil Carbon in Australia - PhD Scholarship

Status: **Closed**

Applications open: 1/06/2020

Applications close: 1/09/2020

About this scholarship

Description/Applicant information

An opportunity is available for an outstanding PhD scholar in the area of soil carbon with the School of Molecular and Life Sciences in the Faculty of Science and Engineering at Curtin University. Maintaining or increasing soil organic carbon (C) is critical to tackling climate change. It is also the most vital element controlling soil health, which enables soils to be resilient. Soil organic C exerts positive effects on soil physical and chemical properties. It increases the soil's capacity to provide ecosystem services, such as the provision of food and the regulation of nutrient cycles and climate. Soil organic SOC storage represents the balance of two main processes: carbon inputs (e.g., net carbon gain by plants) and losses (e.g. microbial decomposition). Research in experimental plots and managed ecosystems suggests that biodiversity has the potential to influence C sequestration by modifying both processes. However, the effects of plant species diversity and organic C storage in rangelands ecosystems are not well known, and the mechanisms of soil C formation, stabilisation and loss are yet to be understood. Theory suggests that climate predominantly controls large-scale patterns of soil C storage, plant diversity and biomass production. However, there is growing evidence that edaphic factors play essential roles and at different spatial scales. For instance, large soil organic C stores can impose positive feedback on species richness and biomass production by affecting soil water-holding capacity and soil fertility. The overall aim of this project is to understand better and to predict the effects of biodiversity and climate change on soil organic C capture and sequestration in the Australian rangelands. The two main activities will involve: (i) experiments to research the links between plant C inputs and the pathways and mechanisms of soil C formation and loss, and (ii) study of the influences of environmental and edaphic (biotic and abiotic) factors on soil organic C storage, plant diversity, productivity, and the interrelationships among these factors across ecological gradients. The successful candidate will gain experience in field and laboratory experimentation, current methodologies for soil C accounting, modern methods of soil and plant analysis, statistical analyses and modelling.

Student type

- Current Students
- Future Students

Faculty

- Faculty of Science & Engineering
 - Science courses

Course type

- Higher Degree by Research

Citizenship

- Australian Citizen
- Australian Permanent Resident
- New Zealand Citizen
- Permanent Humanitarian Visa
- International Student

Scholarship base

- Merit Based

Value

PhD Stipends valued at \$29,000 p.a. each for a maximum of 3.5 years for a student enrolled at Curtin University. For a successful international student, PhD tuition fees offsets will apply.

Scholarship Details



Maximum number awarded

1

Eligible courses

PhD Students

Eligibility criteria

1. Applicants must hold a First or Upper Second-Class Bachelor's degree (or its international equivalent), or a Master's degree in a related science field (soil, ecology, biochemistry, environment, agriculture) with a Merit and a minimum average grade of 60% and substantial research component.
2. Applicants must be personable, work well under supervision and be willing to work in a collaborative environment.
3. Applicants must demonstrate:
 - a. High degree of motivation and aptitude for scientific research
 - b. Have some knowledge and a willingness to learn about soil carbon research
 - c. Have some knowledge and a willingness to learn scripting languages such as R or Python for data manipulation, analysis, modelling and visualisation
 - d. a strong aptitude for scientific writing and publication,
 - e. excellent written and communication skills,
4. Applicants must not be engaged in full-time employment, or be subject to an obligation with another party to provide that party with any intellectual property rights during the course of their research studies.

Enrolment requirements

Progression is subject to passing annual progress reviews.

Changes to Enrolment

The scholarship is a full-time enrolment for a period of 3.5 years. No part time, casual or other allowed.

How to apply

Application process

The successful applicant will be awarded the Scholarship on the following basis:

- academic merit,
- a personal statement that demonstrates the desire for undertaking a PhD program,
- a statement demonstrating motivation and willingness to undertake research in the particular field,
- the required skills and experience as listed in the eligibility criteria
- curriculum vitae and publications
- two academic references

Need more information?

Enquiries

Contact Prof. Raphael VISCARRA ROSSEL on +61 467 769 364 or r.viscarra-rossel@curtin.edu.au

Further information

<http://curtin.edu/soil-landscape-sci>